Christopher G. Tarsitano

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EDUCATION

University of Chicago, Chicago, Illinois
Ph.D. Physical Chemistry, August 2004

University of Chicago, Chicago, Illinois
M.S. Physical Chemistry, August 2000

University of Arizona, Tucson, Arizona
B.S. Chemistry, May 1999
Magna cum laude and Honors

RESEARCH EXPERIENCE

NASA JET PROPULSION LABORATORY, Pasadena, CA, November 2004 – Present
NRC Postdoctoral Fellow, Advisor: Dr. Christopher R. Webster

- Developing miniature mid-IR spectrometers for *in situ* measurements of molecules.
- The compact, low-mass, low-power consumption, tunable spectrometers will be ideal for payloads in planetary exploration.
- NRC proposal, *"High-Sensitivity Cavity Ring-Down Spectrometer Using Quantum Cascade Lasers."*

UNIVERSITY OF CHICAGO, Chicago, IL, January 2000 – August 2004
Graduate Fellow, Advisor: Professor Takeshi Oka

- Probed electronic transitions of the ions and radicals using either a diode laser or a ring dye laser pumped by an ion laser.
- Developed experiments to study molecular ions and radicals in discharges.
- Improved the sensitivity of the spectrometer using a double modulation technique, velocity modulation in conjunction with heterodyne detection.
- Developed a sub-Doppler technique for a positive-column discharge.
- Concluded this work by writing a thesis, *"Highly Sensitive Visible Laser Spectroscopy of Ion and Radicals in Plasmas."*

UNIVERSITY OF ARIZONA, Tucson, AZ, June 1998 – July 1999
Undergraduate Research Assistant, Advisor: Professor Ludwik Adamowicz

- Generated a potential energy surface for the ground state of H_3^+ using *ab initio* calculations.
- Modeled the potential energy surface using explicitly correlated Gaussian functions, which contained the individual atomic and H_2-diatomic terms, in addition to the H_3^+ triatomic terms.
- Concluded this work by writing an Honors thesis, *"Using Explicitly Correlated Gaussian Functions to Model the Potential Energy Hypersurface of H_3^+."*

TECHNICAL SKILLS & INTEREST

- Study molecular ions and radicals of astronomical interest, in particular those species which have potential of being carriers to the diffuse interstellar bands.
- Laser control and automation: Ring Dye Laser, Argon Ion, Diode laser
- Improvement of the sensitivity of the spectrometer: Phase modulation, velocity modulation, concentration modulation
- Absorption spectroscopy, sub-Doppler spectroscopy, spectral data acquisition and analysis
- Plasma chemistry, ion-molecule reactions, molecular discharges, positive column discharges, hollow cathode discharges, high-vacuum systems
- Computer**:** Gamess, Gaussian, HyperChem, Igor Pro, Lab Windows, MATLAB, Mathematica, Mathcad, National Instruments Data Acquisition
- Programming**:** C, Fortran, HTML, LaTeX
- Machining of scientific equipment**:** lathes, mills, and other metal shop equipment

MANAGERIAL EXPERIENCE

WALGREENS DRUGSTORE, Phoenix, AZ, February 1987 – August 1996
Assistant Manager

- Managed all functions pertaining to daily operations.
- Trained, scheduled, and supervised a staff of up to 35 employees.
- Managed a cash flow ranging to $250,000 a month.
- Headed a crew to implement SIMS (computerized inventory control) across a district which contained 30 stores.
- Worked closely under District Manager to reorganize inventory at problematic district stores.

TEACHING EXPERIENCE

Teaching Assistant, General Chemistry Lab, University of Chicago, Chicago, IL
September – December 2000

Teaching Assistant, General Chemistry Lab for Honors, University of Chicago, Chicago, IL
September 1999 – June 2000

Math Instructor, Pharmacy Technician Certification Program, Tucson, AZ
January – March 1998

AWARDS & SPECIAL RECOGNITION

- NRC Postdoctoral Research Fellowship November 2004
- The George Van Dyke Tiers Chemistry Graduate Student Travel Award April 2002
- The National Dean's List 1994-1999
- University of Arizona, Department of Chemistry, Finalist for Outstanding Senior 1999
- Hypercube Scholar May 1999
- University of Arizona Dean's List 1997-1998
- University of Arizona Dean's Honorable Mention List 1996-1997
- Arthur Lee Phelps Memorial Scholarship April 1996

PROFESSIONAL & SCHOLASTIC SOCIETIES

- American Chemical Society
- Golden Key National Honor Society
- Phi Beta Kappa National Honor Society
- Phi Kappa Phi National Honor Society
- Phi Theta Kappa International Honor Society
- Pi Lambda Theta International Honor Society

REFERENCES

Takeshi Oka University of Chicago Dept. of Chemistry (773) 702-7070 t-oka@uchicago.edu	Karl F. Freed University of Chicago Dept. of Chemistry (773) 702-7202 freed@uchicago.edu	Takamasa Momose Kyoto University Graduate School of Science (+81) 75-753-4048 momose@ kuchem.kyoto-u.ac.jp	Ben McCall University of Illinois at Urbana-Champaign Dept. of Chemistry Dept. of Astronomy (217) 244-0230 bjmccall@scs.uiuc.edu

PUBLICATIONS

- Tarsitano, C. G., Neese, C. F., and Oka, T., *High-Resolution Spectroscopy of the* $2^2\Pi_u$ - $X^4\Sigma_g^-$ *Forbidden Transitions of* C_2^+, Journal of Chemical Physics, 121(13), 6290-7 (2004).

- Tarsitano, C. G. and Oka, T., *Rotational Analysis of the (3,3) and (4,4) Bands of the* $A^2\Pi_u$ - $X^2\Sigma_g^+$ *System of* N_2^+ *in the Near-Infrared Using Velocity Modulation Spectroscopy*, Journal of Molecular Spectroscopy, 219(2), 263-70 (2003).

PRESENTATIONS

- Tarsitano, C. G., Neese, C. F., and Oka, T., *High-Resolution Spectroscopy of the* $2^2\Pi_u$ - $X^4\Sigma_g^-$ *Forbidden Transitions of* C_2^+, Fifty-ninth Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, June 21-25, 2004.

- Tarsitano, C. G., Neese, C. F., and Oka, T., *High-Resolution Spectroscopy of the* $B^4\Sigma_u^-$ - $X^4\Sigma_g^-$ *Transition of* C_2^+, University of Chicago, Department of Chemistry, Chicago, Illinois. Poster presented between February 19 and March 11, 2004.

- Tarsitano, C. G., Neese, C. F., and Oka, T., *High-Resolution Spectroscopy of the* $B^4\Sigma_u^-$ - $X^4\Sigma_g^-$ *Transition of* C_2^+, poster presented at: Jewels in Spectroscopy, Chicago, Illinois, June 21, 2003.

- Tarsitano, C. G., Neese, C. F., and Oka, T. , *High-Resolution Spectroscopy of the (0,2) and (6,9) Bands of the* $B^4\Sigma_u^-$ - $X^4\Sigma_g^-$ *Transition of* C_2^+, Fifty-eighth Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, June 16-20, 2003.

- Tarsitano, C. G. and Oka, T., *Near-Infrared Diode Laser Spectroscopy of the A-X System of N_2^+ in the 1.2 – 1.3 μm Region*, Fifty-seventh Ohio State University International Symposium on Molecular Spectroscopy, Columbus, Ohio, June 17-21, 2002.

- Tarsitano, C. G. and Oka, T., *High-Resolution Electronic Spectroscopy of Ions and Radicals*, University of Chicago, Department of Chemistry, Chicago, Illinois. Poster presented between March 21 and April 14, 2002.